

Set	Items	Description
S1	5232	EPOXY?(5W)((PLASTIC OR POLYMER? OR POLYETHYLENE)(5N)METAL? ?)
S2	2754	S1/2002:2011
S3	2478	S1 NOT S2
S4	483273	EPOXY/TI
S5	656	S3 AND S4
S6	7506502	POLYMER/DE
S7	14298844	METAL/DE
S8	1890127	S6 AND S7
S9	227	S5 AND S8
S10	217	RD (unique items)

? show files

File 654:US PAT.FULL. 1976-2011/OCT 13
(c) Format only 2011 Dialog

File 399:CA SEARCH(R) 1967-2010/UD=15517
(c) 2011 American Chemical Society

File 325:Chinese Patents Fulltext 1985-20110928
(c) 2011. SciPat Benelux NV.

File 351:Derwent WPI 1963-2011/UD=201166
(c) 2011 Thomson Reuters

File 323:RAPRA Polymer Library 1972-2011/Jul
(c) 2011 RAPRA Technology Ltd

File 349:PCT FULLTEXT 1979-2011/UB=20111013|UT=20111006
(c) 2011 WIPO/Thomson

File 348:EUROPEAN PATENTS 1978-201141
(c) 2011 European Patent Office

File 340:CLAIMS(R)/US Patent 1950-2011/Oct 13
(c) 2011 IFI/CLAIMS(R)

File 23:CSA Technology Research Database 1963-2011/Sep
(c) 2011 CSA.

File 144:Pascal 1973-2011/Oct W2
(c) 2011 INIST/CNRS

File 8: Ei Compendex(R) 1884-2011/Oct W3
(c) 2011 Elsevier Eng. Info. Inc.

File 36:MetalBase 1965-20111019
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File 108:Aerospace and High Technology Database 1962-2011/Sep
(c) 2011 CSA.

File 32:METADEX 1966-2011/Oct
(c) 2011 CSA.

File 345:Inpadoc/Fam.& Legal Stat 1968-2011/UD=201139
(c) 2011 EPO

File 2:INSPEC 1898-2011/Oct W2
(c) 2011 The IET

File 342:Patents Citation Index 1960-201140
(c) 2011 Thomson Reuters

File 14:Mechanical and Transport Engineer Abstract 1966-2011/Oct
(c) 2011 CSA.

File 324:GERMAN PATENTS FULLTEXT 1967-201141
(c) 2011 UNIVENTIO/THOMSON

File 440:Current Contents Search(R) 1990-2011/Oct 18
(c) 2011 The Thomson Corp

File 34:SciSearch(R) Cited Ref Sci 1990-2011/Oct W3
(c) 2011 The Thomson Corp

File 60:ANTE: Abstracts in New Tech & Engineer 1966-2011/Oct
(c) 2011 CSA.

File 31:World Surface Coatings Abs 1976-2011/Sep
(c) 2011 PRA Coat. Tech. Cen.

File 293:Engineered Materials Abstracts 1966-2011/Oct
(c) 2011 CSA.

File 148:Gale Group Trade & Industry DB 1976-2011/Oct 17
(c) 2011 Gale/Cengage

File 652:US Patents Fulltext 1971-1975
(c) format only 2002 Dialog

File 315:ChemEng & Biotec Abs 1970-2011/May
(c) 2011 DECHEMA

File 347:JAPIO Dec 1976-2011/JUNE(Updated 110926)
(c) 2011 JPO & JAPIO

File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
(c) 2006 The Thomson Corp

File 33:Aluminium Industry Abstracts 1966-2011/Oct
(c) 2011 CSA.

File 353:Ei EnCompassPat(TM) 1964-201110W2
(c) 2011 Elsevier Eng. Info. Inc.

File 6:NTIS 1964-2011/Oct W4
(c) 2011 NTIS, Intl Cpyrght All Rights Res

File 998:NewsRoom 2000-2003
(c) 2011 Dialog

File 16:Gale Group PROMT(R) 1990-2011/Oct 14
(c) 2011 Gale/Cengage

File 761:Datanitor Market Res. 1992-2011/Oct 11
(c) 2011 Datanitor

File 993:NewsRoom 2009
(c) 2011 Dialog

File 19:Chem.Industry Notes 1974-2011/ISS 201141
(c) 2011 Amer.Chem.Soc.

File 95:TEME-Technology & Management 1989-2010/Oct W3
(c) 2010 FIZ TECHNIK

File 88:Gale Group Business A.R.T.S. 1976-2011/Oct 18
(c) 2011 Gale/Cengage

File 103:Energy SciTec 1974-2011/Sep B2
(c) 2011 Contains copyrighted material

File 636:Gale Group Newsletter DB(TM) 1987-2011/Oct 17
(c) 2011 Gale/Cengage

File 20:Dialog Global Reporter 1997-2011/Oct 18
(c) 2011 Dialog

File 994:NewsRoom 2008
(c) 2011 Dialog

File 997:NewsRoom 2004-2005
(c) 2011 Dialog

File 15:ABI/Inform(R) 1971-2011/Oct 19
(c) 2011 ProQuest Info&Learning

File 46:Corrosion Abstracts 1966-2011/Oct
(c) 2011 CSA.

File 57:Electronics & Communications Abstracts 1966-2011/Oct
(c) 2011 CSA.

File 61:Civil Engineering Abstracts. 1966-2011/Oct
(c) 2011 CSA.

File 68:Solid State & Superconductivity Abstracts 1966-2011/Sep

(c) 2011 CSA.
 File 73:EMBASE 1974-2011/Oct 19
 (c) 2011 Elsevier B.V.
 File 155:MEDLINE(R) 1950-2011/Oct 17
 (c) format only 2011 Dialog
 File 47:Gale Group Magazine DB(TM) 1959-2011/Sep 13
 (c) 2011 Gale/Cengage
 File 63:Transport Res(TRIS) 1970-2011/Sep
 (c) fmt only 2011 Dialog
 File 72:EMBASE 1993-2011/Oct 19
 (c) 2011 Elsevier B.V.
 File 484:Periodical Abs Plustext 1986-2011/Oct 18
 (c) 2011 ProQuest
 File 621:Gale Group New Prod.Annou.(R) 1985-2011/Aug 17
 (c) 2011 Gale/Cengage
 File 649:Gale Group Newswire ASAP(TM) 2011/Aug 17
 (c) 2011 Gale/Cengage
 File 764:BCC Market Research 1989-2008/May
 (c) 2008 Business Communication Co.
 File 995:NewsRoom 2007
 (c) 2011 Dialog
 File 35:Dissertation Abs Online 1861-2011/Sep
 (c) 2011 ProQuest Info&Learning

10/5/11 (Item 11 from file: 654)

DIALOG(R)File 654: US PAT.FULL.

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3270413

Utility

REASSIGNED

**Epoxy/polyimide copolymer blend dielectric and
layered circuits incorporating it**

Inventor: Wojnarowski, Robert J., Ballston Lake, NY

Eichelberger, Charles W., Schenectady, NY

Assignee: General Electric Company 02), Schenectady, NY

Examiner: Ryan, Patrick J. (Art Unit: 153)

Assistant Examiner: Lee, Kam F.

Combined Principal Attorneys: Pittman, William H.; Davis, Jr., James C.

	Publication Number	Kind	Date	Application Number	Filing Date
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Main Patent	US 5108825	A	19920428	US 91646112	
19910128					
Division	Pending			US 89454545	19891221

US Classification on document

(Main): 428209 (X-ref): 428413; 4284735; 428901

Examiner Field of Search (US): 428901; 428209; 4284735; 428413

International Classification (Edition 1): B32B-009/00

Cited US Patents:

Patent Number	Date YYYYMM	Main US Class	Inventor
-----	-----	-----	-----
US 3856752	197412		Bateman

US 4480009	198410		Berger
US 4557860	198512		DiSalvo
US 4692272	198709		Gaswami
US 4783695	198811	357065	Eichelberger
US 4824716	198904	428209	Yerman
US 4931539	199006		Hayes

Cited non-US Patents:

Patent Number	Date YYYYMM	Main US Class	Main IPC
EP 99338	198401		

Cited non-Patent References by Examiner:

Lee and Neville, Handbook of Epoxy Resins, McGraw-Hill Book Company, New York (1967), pp. 11:11-12.

Fulltext Word Count: 7537

Number of Claims: 4

Exemplary or Independent Claim Number(s): 1

Number of Drawing Sheets: 2

Number of Figures: 2

Number of US cited patent references: 7

Number of non-US cited patent references: 1

Number of non-patent cited references: 1

Post Issue Legal Status:

Reassignment:

Recorded: 19940713

Action: ASSIGNMENT OF ASSIGNORS INTEREST

Assignor: GENERAL ELECTRIC COMPANY, DATE SIGNED: 03/22/1994

Assignee: MARTIN MARIETTA CORPORATION, 6801 ROCKLEDGE DRIVE, BETHESDA, MARYLAND, 20817

Reel: 007046

Frame: 0736

Contact: GAY CHIN, MARTIN MARIETTA CORPORATION, 6801 ROCKLEDGE DRIVE, BETHESDA, MD 20817

Recorded: 19970714

Action: ASSIGNMENT OF ASSIGNORS INTEREST

Assignor: MARTIN MARIETTA CORPORATION, DATE SIGNED: 01/28/1996

Assignee: LOCKHEED MARTIN CORPORATION, 6801 ROCKLEDGE DRIVE, BETHESDA, MARYLAND, 20817

Reel: 008628

Frame: 0518

Contact: LOCKHEED MARTIN CORPORATION, JOHN J. MORRISSEY, 6801 ROCKLEDGE

DRIVE, MAIL POINT 237, BETHESDA, MD 20817

References to Related Applications:

This application is a division of application Ser. No. 07/454,545 filed

Dec. 21, 1989, now abandoned.

Abstract:

A **copolymer** blend of epoxy and polyimide is used as a dielectric layer in a multilayer interconnect structure. This **copolymer** blend

is free of cracking and crazing, provides good interlayer adhesion and following fabrication, is stable at temperatures in excess of 200[degree(s)] C. A preferred composition is a siloxane polyimide in combination with a cycloalaphatic epoxy.

What is claimed is:

Exemplary or Independent Claim(s):

1. A multilayer structure comprising:
a first epoxy/polyimide **copolymer** blend dielectric layer;
a patterned **metal** layer overlying said dielectric layer; and
a second epoxy/polyimide **copolymer** blend dielectric layer over said patterned **metal** layer.

Non-exemplary or Dependent Claim(s):

2. The multilayer structure recited in claim 1 wherein:
said second epoxy/polyimide **copolymer** blend dielectric layer is disposed on said first epoxy/polyimide **copolymer** blend dielectric layer and said patterned **metal** layer.
3. The multilayer structure recited in claim 1 further comprising:
a thermoplastic layer disposed on said first epoxy/polyimide **copolymer** blend dielectric layer and said patterned **metal** layer.
4. The multilayer structure recited in claim 3 wherein:
said second epoxy/polyimide **copolymer** blend dielectric layer is disposed on said thermoplastic layer.

10/5/12 (Item 12 from file: 654)

DIALOG(R)File 654: US PAT.FULL.

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3049691

Derwent Accession: 1989-150734

Utility

REASSIGNED, EXPIRED

C/ **Divinyl epoxy ethers**

; FORMING COATING CONTAINING A CROSSLINKABLE BASE RESIN, A CROSSLINKING INITIATOR, AND A CROSSLINKING AMOUNT OF **EPOXY** DIVINYL ETHER

Inventor: Dougherty, James A., Prospect Park, NJ

Vara, Fulvio J., Chester, NJ

Anderson, Lowell R., Morristown, NJ

Assignee: GAF Chemicals Corporation 02), Wayne, NJ

GAF Chemicals Corp (Code: 22153)

Examiner: Silverman, Stanley (Art Unit: 139)

Combined Principal Attorneys: Maue, Marilyn J.; Ward, Joshua J.

	Publication Number	Kind	Date	Application Number	Filing Date
	-----	--	-----	-----	-----
Main Patent	US 4908227	A	19900313	US 88237489	
19880829					
Division	Abandoned			US 87109389	19871016
Current US Classification (Main):	427496000				
(X-ref):	427508000; 427517000; 549539000; 549554000; 549555000				

US Classification on document

(Main): 427044 (X-ref): 549539; 549554; 549555

Examiner Field of Search (US): 549539; 549554; 549555; 427044

International Classification (Edition 1): B05D-003/06

Cited US Patents:

Patent Number	Date YYYYMM	Main US Class	Inventor
US 3203939	196508	549555	Tinsley
US 3414634	196812	549555	Sorkin
US 3699131	197210	549539	Wang
US 4137138	197901	427044	Batt
US 4593051	198606	427044	Koleske
US 4714655	195712	427044	Bordoloi

Cited non-US Patents:

Patent Number	Date YYYYMM	Main US Class	Main IPC
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GB 1023783 196603

Fulltext Word Count: 3896

Number of Claims: 9

Exemplary or Independent Claim Number(s): 1

Number of US cited patent references: 6

Number of non-US cited patent references: 1

Post Issue Legal Status:

Expiration Date (O.G. Date): 19980318 (19980526)

Calculated Expiration Date: 20071016

Reassignment:

Recorded: 19901030

Action: CHANGE OF NAME EFFECTIVE APRIL 10, 1989

Assignor: GAF CORPORATION, A DE CORP., DATE SIGNED: 04/10/1989

Assignee: DORSET INC., A DE CORP.

Reel: 005250

Frame: 0940

Contact: GAF CORPORATION, PATENT DEPT., 1361 ALPS ROAD, WAYNE, NJ 07470

Recorded: 19901203

Action: SECURITY INTEREST

Assignor: GAF CHEMICALS CORPORATION, A CORP. OF DE, DATE SIGNED: 09/17/1990

Assignee: CHASE MANHATTAN BANK (NATIONAL ASSOCIATION), THE

Reel: 005604

Frame: 0020

Contact: DAWN M. MARMO, MILBANK, TWEED, HADLEY & MCCLOY, 1 CHASE MANHATTAN PLAZA, NEW YORK, NY 10005

Recorded: 19910617

Action: ASSIGNMENT OF ASSIGNORS INTEREST.

Assignor: GAF CHEMICALS CORPORATION, DATE SIGNED: 05/08/1991

Assignee: ISP 3 CORP, A CORP OF DELAWARE

Reel: 005949

Frame: 0001

Contact: JOSHUA WARD, GAF CORPORATION, 1361 ALPS ROAD, WAYNE, NEW JERSEY
07470

Recorded: 19910617
Action: CHANGE OF NAME EFFECTIVE ON 06/06/1991
Assignor: ISP 3 CORP., DATE SIGNED: 05/08/1991
Assignee: ISP INVESTMENTS INC., A CORP OF DELAWARE
Reel: 005949
Frame: 0051
Contact: JOSHUA WARD, GAF CORPORATION, 1361 ALPS ROAD, WAYNE, NEW JERSEY
07470

Recorded: 19920813
Action: RELEASE BY SECURED PARTY
Assignor: CHASE MANHATTAN BANK, THE (NATIONAL ASSOCIATION), DATE SIGNED:
08/04/1992
Assignee: GAF CHEMICALS CORPORATION
SUTTON LABORATORIES, INC.
GAF BUILDING MATERIALS CORPORATION
Reel: 006243
Frame: 0208
Contact: MILBANK, TWEED, HADLEY & MCCLOY, JACQUELINE E. PENNINO, 1 CHASE MANHATTAN PLAZA, NEW YORK, NY 10005-1413

References to Related Applications:

This is a division of U.S. patent application Ser. No. 109,389, filed Oct. 16, 1987 now abandoned.

Abstract:

This invention relates to divinyl epoxy ethers having the formula
(chemical structure - see patent image)

wherein x and x' are integers each having a value of from 0 to 3 and to the preparation and use of the above divinyl **epoxy** ethers for **metal**, wood or **plastic** coatings which possess high resistance to solvents and improved flexibility over saturated epoxy compounds.

What is claimed is:

Exemplary or Independent Claim(s):

1. The process of formulating a coating containing a cross-linkable base resin, a cross-linking initiator and an effective cross-linking amount of an epoxy divinyl ether compound having the formula
chemical structure - see patent image)
wherein x and x' each independently have a value of from 0 to 3 and
coating said formulation on a substrate.

Non-exemplary or Dependent Claim(s):

2. The process of claim 1 wherein said formulation is coated on

substrate in a thickness of between about 0.02 mil and about 30 mil

and is cured thereon at a temperature of between about 25[degree(s)]

C. and about 250[degree(s)] C.

3. The process of claim 2 wherein said formulation is coated on a **metal** substrate in a thickness of between about 0.5 mil and about 5 mils and is cured thereon at a temperature of between about

50[degree(s)] C. and about 200[degree(s)] C.

4. The process of claim 1 wherein said coating is cured on the substrate

by exposure to a source of radiation or heat.

5. The process of claim 1 wherein said coating is cured on the substrate

by exposure to an electron beam at from about 0.5 to about 5 megarads.

6. The process of claim 4 wherein said coating is cured by exposure to

UV light at between about 0.15 joules/cm² and about 225 joules/cm².

7. The process of claim 6 wherein said coating is cured at between about

6 joules/cm² and about 150 joules/cm².

8. The process of claim 1 wherein x and x' in said epoxy divinyl ether

have a positive value.

9. The process of claim 1 wherein x and x' in said epoxy divinyl ether

are zero.

10/5/13 (Item 13 from file: 654)

DIALOG(R)File 654: US PAT.FULL.

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2930652 **IMAGE Available

Derwent Accession: 1988-106634

Utility

EXPIRED

CE/ **Method for producing circuit boards with deposited metal patterns and circuit boards produced thereby**

; COATING WITH **EPOXY** RESIN RUBBER BLEND AND CURING, ETCHING THEN METALLIZATION

Inventor: Chant, Peter R., Burlington, CA

Assignee: Firan Corporation 03), Oakville, CA

FIRAN CORP (Code: 14483)

Examiner: Nimmo, Morris H. (Art Unit: 215)

	Publication Number	Kind	Date	Application Number	Filing Date
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Main Patent	US 4797508	A	19890110	US 8790043	
19870831					

CIP US 4707394 A 19871117 US 86909256 19860919

Disclaimer Date: 20041117

Current US Classification (Main): 174258000

(X-ref): 029846000; 156150000; 216018000; 216020000; 216058000;
216067000
; 216083000; 427096000; 427098000; 428209000; 428416000; 428601000;
428901000

US Classification on document

(Main): 1740685 (X-ref): 029846; 156150; 156630; 156634; 156650;
156656;
1566591; 156668; 156902; 427096; 427098; 428209; 428416; 428601;
428901

Examiner Field of Search (US): 1740685; 029846; 156150; 156630; 156634;
156643; 156650; 156656; 1566591; 156668; 156901; 156902; 428156;
428172
; 428209; 428601; 428416; 428418; 428901; 427096; 427098; 204015;
204030

International Classification (Edition 1): H05K-001/00; B32B-003/00;
C23F-001/02; B29C-037/00

Cited US Patents:

Patent Number	Date YYYYMM	Main US Class	Inventor
US 3226256	196301	427096	Schneble
US 3312754	196704	260837	Marks
US 3625758	197112	174685	Stahl
US 3639500	197202	260837	Muny
US 3737339	197306	204015	Alsberg
US 3892819	197507	260836	Najvar
US 3910992	197510	260485	Skillicorn
US 3956041	197605	156237	Polichette
US 4254186	198103	428462	Acitelli
US 4374868	198302	427097	Stahl
US 4389268	198306	156150	Oshima
US 4402998	198309	427097	Kumagai
US 4469777	198409	430315	O'Neil
US 4476285	198410	525113	Crabtree
US 4511757	198504	174685	Ors
US 4517050	198505	156643	Johnson
US 4707394	198711		Chant
	x-ref:	1740685	

Fulltext Word Count: 5768

Number of Claims: 24

Exemplary or Independent Claim Number(s): 1,19

Number of Drawing Sheets: 1

Number of Figures: 3

Number of US cited patent references: 17

Post Issue Legal Status:

Expiration Date (O.G. Date): 20010110 (20010313)

Calculated Expiration Date: 20060919

References to Related Applications:

CROSS-REFERENCE TO RELATED APPLICATION

The present application is a continuation-in-part of application Ser. No. 06/909,256 filed Sept. 19, 1986, now U.S. Pat. No. 4,707,394 Nov. 17, 1987.

Abstract:

A process for producing circuit boards involves the coating of a resinous substrate with a fluid mixture of an epoxy **polymer** component and a rubber **polymer** which is interactive therewith at temperatures of at least 180[degree(s)] F. Preferably the rubber is a low molecular weight polyfunctional reactive butadiene/acrylonitrile **interpolymer** which is terminated by vinyl or carboxyl functional groups. The rubber component comprises at least 70 percent by weight of the epoxy **polymer** component, and the coating has a thickness of 0.001-0.015 inch. The coating is partially cured to effect partial polymerization of the epoxy **prepolymer**, further polymerization of the rubber, if it is low molecular weight, and interaction of the rubber and epoxy **polymer** to form a matrix of the interacted rubber/epoxy. The exposed surface of this coating is then etched, and **metal** is deposited on the surface to form a conductive layer. A conductive pattern is formed therein, and heat and pressure are then applied to the conductive pattern and coating to fully cure the coating and bond the coating to the **metal** layer, and thus the conductive pattern to the resinous substrate. The **metal** layer may be deposited chemically or by vacuum metallizing and like techniques.

Having thus described the invention, what is claimed is:

Exemplary or Independent Claim(s):

1. In a process for producing circuit boards having a metallized circuit pattern firmly bonded to a resinous substrate, the steps comprising:
 - a) coating a resinous substrate with a fluid mixture of a formulation containing; i) a low molecular weight polyfunctional reactive rubber component comprising an **interpolymer** of butadiene and acrylonitrile; and ii) an epoxy **polymer** component, said components being interactive at temperatures of at least 180[degree(s)] F., said rubber component comprising 50-200 percent by weight of the epoxy **polymer** component, said coating having a thickness of 0.0005-0.015 inch; b) partially curing the coating to produce partial cross-linking of said epoxy **polymer** component, further polymerization of the rubber, and interaction of said rubber and epoxy **polymer** components; c) etching the exposed surface of the coating to produce a microporous surface; d) depositing **metal** on the microporous surface of the coating to form a conductive layer with microformations extending into the recesses of said microporous surface; e) applying heat and pressure to said

conductive layer and coating to fully cure said coating, thereby firmly bonding said coating to said **metal** layer and thereby said conductive layer through said coating to said resinous substrate; and f) electrodepositing **metal** on said conductive layer to form a conductive pattern therewith, said conductive pattern being bonded firmly to said substrate through said conductive layer and coating.

19. In a circuit board, the combination comprising: a) a resinous substrate; b) an intermediate coating on one surface of said substrate of about 0.0005-0.015 inch and containing a rubber component and an epoxy **polymer** which have interacted to provide a matrix of the interacted rubber/epoxy **polymer**, said rubber component comprising at least 35 percent by weight of said coating; and c) a **metal** conductive pattern on said coating providing a circuit, said conductive pattern having a base **metal** layer with microformations at the interface with said coating an extending thereinto, said conductive pattern being embedded in said coating to a depth substantially equal to the thickness of said base **metal** layer, said coating being firmly bonded to said base **metal** layer and said conductive pattern thereby being bonded through said coating and base **metal** layer to said substrate.

Non-exemplary or Dependent Claim(s):

2. The process in accordance with claim 1 wherein said rubber **interpolymer** has terminal functional groups selected from vinyl and carboxyl.
3. The process in accordance with claim 1 wherein said rubber **interpolymer** has a Brookfield viscosity of 100-400,000 cps at 27[degree(s)] C.
4. The process in accordance with claim 1 wherein said functional terminals groups interact with the epoxy **polymer** component during curing thereof.
5. The process in accordance with claim 1 wherein said etching step utilizes a chemical etchant to attack the exposed surface of said coating and produce the microporous characteristic.
6. The process in accordance with claim 1 wherein said etching step utilizes a plasma to attack the exposed surface of said coating and produce the microporous characteristic.
7. The process in accordance with claim 1 wherein said **metal** layer is deposited by a process of vacuum metallizing.
8. The process in accordance with claim 1 wherein said **metal** layer is deposited by electroless chemical deposition from a metallic solution.
9. The process in accordance with claim 1 wherein said terminal functional group is a vinyl group and wherein said rubber component comprises 100-200% by weight of the epoxy **prepolymer** component.
10. The process in accordance with claim 1 wherein said step or partially curing the coating comprises developing a temperature of 250[degree(s)]-350[degree(s)] F. in the coating for a period of at

- least 2 hours, and wherein said step of fully curing the coating comprises developing a temperature in the coating of 280[degree(s)]-350[degree(s)] F. for a period of at least 2 hours.
11. The process in accordance with claim 1 wherein said step of applying heat and pressure at least partially embeds said conductive layer in the coating.
12. The process in accordance with claim 1 wherein a continuous layer of **metal** is initially deposited on said coating and thereafter selectively etched to remove said layer between said elements of said conductive pattern.
13. In a process for producing circuit boards having a metallized circuit pattern firmly bonded to a resinous substrate, the steps comprising:
- a) coating a resinous substrate with a fluid mixture of a formulation containing a rubber component and an epoxy **polymer** component which are interactive at temperatures of at least 180[degree(s)] F.,
- said rubber component comprising 50-200 percent by weight of the epoxy **polymer** component, said coating having a thickness of 0.0005-0.0015 inch; b) partially curing the coating to produce partial cross-linking of said epoxy **polymer** component, and interaction of said rubber component and epoxy **polymer** components to form a matrix of the interacted rubber and epoxy components; c) etching the exposed surface of the coating to produce a microporous surface; d) depositing **metal** on said microporous surface of the coating to form a conductive layer with microformations extending into the recesses of said microporous surface; e) applying heat and pressure to said conductive layer and coating to fully cure said coating, thereby firmly bonding said coating to said conductive layer and thereby said conductive layer through said coating to said resinous substrate, said heat and pressure embedding said conductive layer in said coating; and f) electrodepositing **metal** on said conductive layer to form a conductive pattern therewith.
14. The process in accordance with claim 13 wherein said rubber component has functional terminal groups which interact with the epoxy **prepolymer** component during said **metal** curing step.
15. The process in accordance with claim 13 wherein said etching step utilizes a chemical etchant to attack the exposed surface of said coating and produce the microporous characteristic.
16. The process in accordance with claim 13 wherein said a conductive layer is deposited by a process of vacuum metallizing.
17. The process in accordance with claim 13 wherein said rubber component is a low molecular weight polyfunctional reactive rubber comprising a **interpolymer** of butadiene and acrylonitrile which is terminated by a functional vinyl group and wherein said rubber

component comprises 100-200% by weight of the epoxy **polymer** component.

18. The process in accordance with claim 17 wherein said rubber **interpolymer** has terminal functional groups selected from vinyl and carboxyl.

20. The circuit board in accordance with claim 19 wherein said circuit board is produced by a process comprising the steps of: a) coating a resinous substrate with a fluid mixture of a formulation containing a rubber component and an epoxy **polymer** component which are interactive at temperatures of at least 180[degree(s)] F., said rubber component comprising 50-200 percent by weight of the epoxy **polymer** component in said formulation, said coating having a thickness of 0.0005-0.015 inch and containing at least 35 percent by weight of said rubber component; b) partially curing the coating to produce partial cross-linking of said epoxy **polymer** component, and interaction of said rubber and epoxy **polymer** components to form a matrix of the interacted rubber and epoxy components; c) etching the exposed surface of the coating to produce a microporous surface; d) depositing **metal** on said microporous surface of the coating to form a conductive layer with microformations extending into the recesses of said microporous surface; e) applying heat and pressure to said conductive pattern and coating to fully cure said coating, thereby firmly bonding said coating to said conductive layer and thereby said conductive layer through said coating to said resinous substrate, said heat and pressure embedding said conductive layer in said coating; and f) electrodepositing **metal** on said conductive layer to form a conductive pattern therewith.

21. The circuit board of claim 20 wherein said rubber component is a rubbery **polymer** with terminal functional groups selected from vinyl and carboxyl.

22. The circuit board of claim 21 wherein said rubbery **polymer** has a Brookfield viscosity of 100-400,000 cps at 27[degree(s)] C.

23. The circuit board of claim 20 wherein said rubber component is a low molecular weight polyfunctional reactive rubber comprising an **interpolymer** of butadiene and acrylonitrile which is terminated by a functional vinyl group and wherein said rubber component comprises 100-200% by weight of the epoxy **polymer** component.

24. The circuit board of claim 19 wherein said rubber component comprises at least 50 percent by weight of said coating.

10/5/17 (Item 17 from file: 654)

DIALOG(R)File 654: US PAT.FULL.

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2698021 **IMAGE Available

Derwent Accession: 1986-118764

Utility

C/ **Method of providing an adherent metal coating on an epoxy surface**

; SPUTTER ETCHING FOLLOWED BY VACUUM DEPOSITION

Inventor: Shanefield, Daniel J., Princeton Township, Mercer County, NJ

Verdi, Fred W., Lawrence Township, Mercer County, NJ

Assignee: AT&T Technologies, Inc. 02), Berkeley Heights, NJ

AT&T TECHNOLOGIES INC (Code: 11052)

Examiner: Kimlin, Edward (Art Unit: 131)

Assistant Examiner: Hoch, Ramon R.

Combined Principal Attorneys: Spivak, J. F.

	Publication Number	Kind	Date	Application Number	Filing Date
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Main Patent	US 4582564	A	19860415	US 83543702	
19831020					
Division	US 4444848	A		US 82337054	19820104

Current US Classification (Main): 216018000

(X-ref): 204192360; 205125000; 205165000; 205205000; 216039000;
427098000

; 427099000; 427306000; 427307000; 430314000

US Classification on document

(Main): 156643 (X-ref): 156668; 156902; 204030; 2040321; 204192E;
204192EC

; 427040; 427098; 427099; 427306; 427307

Examiner Field of Search (US): 156150; 156151; 156643; 1566591; 156645;
156668; 156902; 156153; 1562726; 204192E; 204192EC; 204192C; 204030;
2040321; 2040345; 427097; 427098; 427099; 427040; 427307; 427322;
427304; 427306

International Classification (Edition 1): H05K-003/38; H05K-003/24;
H05K-003/06; C25D-005/56

Cited US Patents:

Patent Number	Date YYYYMM	Main US Class	Inventor
-----	-----	-----	-----
US RE29820	197810	156630	Konicek
US 3296099	196701	204015	Dinella
US 3679472	197207	017212	Crosby
US 3770571	197311	156150	Alsberg
US 3925138	197512	156150	Shaul
US 4031313	197706	1740685	Franz
US 4056642	197711	427084	Saxena
US 4085022	197804	204192E	Wechsung
US 4100312	197807	427096	Lombardo
US 4105118	197808	2065242	Williams, Jr.
US 4110147	197808	156306	Grunwald
US 4113578	197809	204015	Del Monte
US 4115185	197809	156634	Carlson

US 4121007	197810	427098	Kobayashi
US 4129848	197812	338308	Frank
US 4135988	197901	204015	Dugan
US 4148945	197904	427304	Bangs
US 4153529	197905	204192EC	Little
US 4160045	197907	427038	Longshore
US 4166018	197908	204192R	Chapin
US 4193849	198003	204015	Sato
US 4353954	198210	428216	Yamaoka
US 4354911	198210	204192EC	Dodd
US 4389268	198306		Oshima
	x-ref:	156668	

Cited non-US Patents:

Patent Number	Date YYYYMM	Main US Class	Main IPC
DE 2536152	197602	156150	
JP 53140577	197812	156150	
JP 5441990	197912	427098	
JP 56153796	198111		

Cited non-Patent References by Examiner:

D. J. Levy et al., "Interfacial Bonding of Nickel to Polyamide-Imide,"
Plating and Surface Finishing, Jun. 1979, pp. 68-71.

L. R. Volpe et al., "Metriform Fabrication Spurs Development of High
Density Circuits," Electronic Packaging and Production, May 1981,
pp. 69-75.

Fulltext Word Count: 4774

Number of Claims: 13

Exemplary or Independent Claim Number(s): 1

Number of Drawing Sheets: 2

Number of Figures: 6

Number of US cited patent references: 24

Number of non-US cited patent references: 4

Number of non-patent cited references: 2

Calculated Expiration Date: 20030415

References to Related Applications:

This is a division of application Ser. No. 337,054, filed 1/4/82,
U.S.

Pat. No. 4,444,848.

Abstract:

A method of forming adherent metallized coatings on a substrate
which
is useful for the manufacture of printed circuit boards as well as
other
metal coated articles involves providing the substrate with a
rubber-modified epoxy surface or coating, sputter etching at least 50
A.
from the surface followed by vacuum depositing an adherent thin metal
film of Cr, Ni, Ni-V alloy, Pt, Pd or Ti onto the substrate. Another
metal layer is then provided over the adherent thin film.

What is claimed is:

Exemplary or Independent Claim(s):

1. A method of metallizing an article having a surface comprising a rubber-modified epoxy resin or an epoxy resin having a high degree of unsaturation excluding aromatic unsaturation comprises the steps of:
a) sputter etching the substrate so as to remove at least 50A. from the surface of the substrate; b) vacuum depositing a thin adherent base metal film of a metal selected from the group consisting of Cr, Ni, Ni-V alloy, Pd, Pt and Ti onto the surface of the epoxy resin; and c) depositing a primary metal film over the thin base metal film.

Non-exemplary or Dependent Claim(s):

2. The method recited in claim 1 wherein the adherent base metal film is vacuum deposited without breaking the vacuum after sputter etching and further wherein the thicker primary metal is also deposited by means of vacuum deposition.
3. The method recited in claim 1 wherein the thin base metal film is from 100A. to 10,000A.
4. The method recited in claim 14 wherein the thin base metal film is in the order of 1,000A.
5. The method recited in claim 1 wherein metallization is in the form of a predetermined pattern.
6. The method recited in claim 1 wherein a final thick metal coating is applied to the substrate by means of electroless or electroplating.
7. The method recited in claim 2 wherein the thin base metal film is applied by means of magnetron sputter etching and wherein said base metal film consists essentially of a nickel-vanadium alloy.
8. A method of forming a circuit pattern on a substrate having a plurality of spaced through-holes and a substrate surface comprising a rubber-modified epoxy resin or an epoxy resin having a high degree of unsaturation excluding aromatic unsaturation comprising the steps:
a) sputter etching the substrate so as to remove at least 50A. from the surface of the substrate; b) vacuum depositing a thin film of a metal base selected from the group consisting of Cr, NI, Ni-V alloy, Pd, Pt and Ti onto the major surfaces and through-holes; c) depositing a thicker primary metal over the thin base metal film; and d) forming a circuit pattern by means of etching unwanted portions of the previously applied metal films.
9. The method recited in claim 8 wherein said thin base metal film is

from 100A. to 10,000A. thick.

10. A method of forming a circuit pattern on a substrate having a plurality of spaced through-holes and a substrate surface comprising
a rubber-modified epoxy resin or an epoxy resin having a high degree
of unsaturation excluding aromatic unsaturation comprising the steps:
a) sputter etching the substrate so as to remove at least 50A. from
the surface of the substrate; b) vacuum depositing an adherent thin
film of a metal selected from the group consisting of Cr, Ni, Ni-V alloy, Pd, Pt and Ti onto the major surfaces and through-holes; c) depositing a thicker primary metal over the thin base metal film;
d)
defining a circuit pattern by applying, imaging and developing a photoresist in the form of said pattern over the substrate surface;
e) etching away the exposed metal portions not covered by photoresist; and f) electroplating a thick layer of copper over the
remaining metal, the thickness of which is at least sufficient to provide good electrical conductivity.

11. A method of forming a circuit pattern on a substrate having a plurality of spaced through-holes and a substrate surface comprising
a rubber-modified epoxy resin or an epoxy resin having a high degree
of unsaturation excluding aromatic unsaturation comprising the steps:
a) sputter etching the substrate so as to remove at least 50A. from
the surface of the substrate; b) vacuum depositing an adherent thin
film of a metal selected from the group consisting of Cr, Ni, Ni-V alloy, Pd, Pt and Ti onto the major surfaces and through-holes; c) depositing a thicker primary metal over the thin base metal film;
d)
defining a circuit pattern by applying, imaging and developing a photoresist in the form of said pattern over the substrate surface;
e) electroplating a thick copper layer over the exposed metal; f) applying a tin alloy etch resist over the thick copper layer; g) stripping the photoresist; and h) etching away the underlying primary
metal layer and thin base metal film.

12. A method of forming a circuit pattern on a substrate having a plurality of spaced through-holes and a substrate surface comprising
a rubber-modified epoxy resin or an epoxy resin having a high degree
of unsaturation excluding aromatic unsaturation comprising the steps:
a) sputter etching the substrate so as to remove at least 50A. from

the surface of the substrate; b) vacuum depositing an adherent thin film of a metal selected from the group consisting of Cr, Ni, Ni-V alloy, Pd, Pt and Ti onto the major surfaces and through-holes; c) depositing a thicker primary metal over the thin base metal film; d) defining a circuit pattern by applying, imaging and developing a photoresist in the form of said pattern over the substrate surface; e) electrolessly plating a thick copper layer over the exposed metal; f) stripping the photoresist; and g) etching away the metal underlying the photoresist.

13. The method recited in claim 11 wherein the adherent thin metal film is in the order of about 1 microinch thick and the thicker primary metal layer is in the order of about 40 microinches thick.

10/5/20 (Item 20 from file: 654)

DIALOG(R)File 654: US PAT.FULL.

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2549524

Derwent Accession: 1984-120619

Utility

EXPIRED

C/ **Adherent metal coatings on rubber-modified epoxy resin surfaces**

; PRINTED CIRCUITS

Inventor: Shanefield, Daniel J., Princeton Township, Mercer County, NJ

Verdi, Fred W., Lawrence Township, Mercer County, NJ

Assignee: Western Electric Co., Inc. 02), New York, NY

AT&T TECHNOLOGIES INC (Code: 11052)

Examiner: O'Keefe, Veronica (Art Unit: 111)

Combined Principal Attorneys: Spivak, J. F.

	Publication Number	Kind	Date	Application Number	Filing Date
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Main Patent 19820104	US 4444848	A	19840424	US 82337054	

Current US Classification (Main): 428624000

(X-ref): 427304000; 428617000; 428618000; 428621000; 428625000;
428626000

; 428675000; 428680000; 428926000

US Classification on document

(Main): 428624 (X-ref): 428626; 428675; 428680; 428926; 428618; 428621;
428625; 428611; 427304

Examiner Field of Search (US): 428624; 428416; 428418; 428626; 428926;
1740685; 156150; 204192E; 204192EC; 204192C; 427307

International Classification (Edition 1): C23F-001/02

Cited US Patents:

Patent Number	Date YYYYMM	Main US Class	Inventor
US RE29820	197810	204043R	Konicek
US 3296099	196701	204015	Dinella
US 3585010	197106	428926	Luce
US 3679472	197207	017002	Crosby
US 3990926	197611	204043R	Konicek
US 4031313	197706	428418	Franz
US 4056642	197711	427084	Saxena
US 4085022	197804	204192E	Wechsung
US 4100312	197807	428418	Lombardo
US 4105118	197808	428418	Williams
US 4110147	197808	428418	Grunwald
US 4113578	197809	204015	Del Monte
US 4115185	197809	156634	Carlson
US 4121007	197810	428201	Kobayashi
US 4129848	197812	338308	Frank
US 4135988	197901	204015	Dugan
US 4148945	197904	427304	Bangs
US 4153529	197905	204192EC	Little
US 4160045	197907	427038	Longshore
US 4166018	197908	204192R	Chapin
US 4176142	197911	525342	Lewis
US 4193849	198003	204038B	Sato
US 4344996	198208	204192EC	Banks
US 4351697	198209	427307	Shanefield
US 4353954	198210	428418	Yamaoka

Cited non-US Patents:

Patent Number	Date YYYYMM	Main US Class	Main IPC
JP 6153796	198111	428418	

Cited non-Patent References by Examiner:

D. J. Levy et al., Plating & Surface Finishing, Jun. 1979, pp. 68, 70, 71.
 Luke R. Volpe et al., Electronic Packaging and Production, May 1981, pp. 69, 70, 72, 73, 74, 75.

Fulltext Word Count: 4080

Number of Claims: 6

Exemplary or Independent Claim Number(s): 1

Number of Drawing Sheets: 2

Number of Figures: 6

Number of US cited patent references: 25

Number of non-US cited patent references: 1

Number of non-patent cited references: 2

Post Issue Legal Status:

Expiration Date (O.G. Date): 19960424 (19960702)

Calculated Expiration Date: 20020104

Abstract:

A method of forming adherent metallized coatings on a substrate which is useful for the manufacture of printed circuit boards as well as other

metal coated articles involves providing the substrate with a rubber-modified epoxy surface or coating, sputter etching at least 50 A.

from the surface followed by vacuum depositing an adherent thin **metal** film of Cr, Ni, Ni-V alloy, Pt, Pd or Ti onto the substrate. Another **metal** layer is then provided over the adherent thin film. What is claimed is:

Exemplary or Independent Claim(s):

1. An article of manufacture comprising: a) a substrate having a surface

of a rubber-modified epoxy resin, said surface having any weak boundary layer thereon essentially removed; b) a thin adherent base

metal film selected from the group consisting of Cr, Ni, Ni-V alloy, Pd, Pt, or Ti on said surface, said **metal** having been vacuum deposited on the surface; and c) a thicker primary **metal** deposited over the base **metal** film said primary **metal** having a peel strength of at least 8 pounds/inch.

Non-exemplary or Dependent Claim(s):

2. The article recited in claim 1 wherein said rubber-modified epoxy resin contains an acrylonitrile-butadiene type rubber.
3. The article recited in claim 1 wherein the weak boundary layer was removed by means of sputter etching at least 50 A. from the surface of the substrate.
4. The article recited in claim 3 wherein the thickness of the base **metal** is from 30 A. to 10,000 A.
5. The article recited in claim 3 wherein the thickness of the base **metal** film is in the order of 1,000 A.
6. The article recited in claim 1 wherein the primary **metal** is selected from the group consisting of copper, nickel or a mixture thereof.

Dialog eLink:

USPTO Full Text Retrieval Options

10/5/37 (Item 6 from file: 399)

DIALOG(R)File 399: CA SEARCH(R)

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130026273 CA: 130(3)26273u PATENT

Stable cationic electrophoretic coating compositions, giving cured coatings with higher concentration of anticorrosive epoxy resin near metal substrate and weather-resistant acrylic polymers on the surface

Inventor (Author): Inoue, Tsuyoshi; Ishii, Toshiyuki; Tatsumi, Takeshi

Location: Japan,

Assignee: Nippon Paint Co., Ltd.

Patent: Japan Kokai Tokkyo Koho ; JP 98292131 A2 ; JP 10292131 **Date:** 19981104

Application: JP 97114242 (19970416)

Pages: 8 pp.

CODEN: JKXXAF

Language: Japanese

Patent Classifications:

Class: C09D-005/44A; C09D-133/04B; C09D-163/00B; C09D-175/04B; C08G-018/58B

Section:

CA242010 Coatings, Inks, and Related Products

Identifiers: acrylic epoxy polyurethane electrophoretic coating multiphase

Descriptors:

Polyurethanes,uses ...

acrylic-epoxy; stable cationic electrophoretic coating compns., giving cured coatings with higher concn. of anticorrosive epoxy resin near metal substrate and weather-resistant acrylic polymers on the

Epoxy resins,uses ...

acrylic-polyurethane-; stable cationic electrophoretic coating compns., giving cured coatings with higher concn. of anticorrosive epoxy resin near metal substrate and weather-resistant acrylic polymer

Anticorrosive coatings... Electrodeposits... Weather-resistant coatings ...

stable cationic electrophoretic coating compns., giving cured coatings with higher concn. of anticorrosive epoxy resin near metal substrate and weather-resistant acrylic polymers on the surface

CAS Registry Numbers:

25068-38-6DP cationic derivs., stable cationic electrophoretic coating compns., giving cured coatings with higher concn. of anticorrosive epoxy resin near metal substrate and weather-resistant acrylic polymers on the surface

109-83-1DP 10595-60-5DP reaction products with epoxy resins, stable cationic electrophoretic coating compns., giving cured coatings with higher concn. of anticorrosive epoxy resin near metal substrate and weather-resistant acrylic polymers on the surface

206876-63-3DP 216319-41-4DP reaction products with N-methylethanolamine, stable cationic electrophoretic coating compns., giving cured coatings with higher concn. of anticorrosive epoxy resin near metal substrate and weather-resistant acrylic polymers on the surface

41704-39-6P 68083-48-7P 216319-35-6P stable cationic electrophoretic coating compns., giving cured coatings with higher concn. of anticorrosive epoxy resin near metal substrate and weather-resistant acrylic polymers on the surface

10/5/78 (Item 27 from file: 351)

DIALOG(R)File 351: Derwent WPI

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0005755890 *Drawing available*
WPI Acc no: 1991-371241/199151
XRAM Acc no: C1991-159994
XRPX Acc No: N1991-284250

Vibration damping sheet covering wide temp. range - comprises layer comprising butyl rubber, polyoctenylene and an polyolefin-polyepoxy -contg. polyacrylic ester copolymer, between two metal layers

Patent Assignee: DAICEL HUELS LTD (DAIL)

Inventor: KITA M

Patent Family (4 patents, 3 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
GB 2244954	A	19911218	GB 199013353	A	19900614	199151	B
			GB 199013353	A	19900614		
DE 4020512	A	19920102	DE 4020512	A	19900627	199202	NCE
US 5232785	A	19930803	US 1990538122	A	19900614	199332	NCE
			US 1992927191	A	19920807		
GB 2244954	B	19930922	GB 199013353	A	19900614	199338	E

Priority Applications (no., kind, date): GB 199013353 A 19900614; DE 4020512 A 19900627; US 1992927191 A 19920807

Patent Details

Patent Number	Kind	Lan	Pgs	Draw	Filing Notes
US 5232785	A	EN	7	4	Continuation of application US 1990538122
GB 2244954	B	EN	0	2	

Alerting Abstract GB A

A vibration damping sheet comprises two sheets of **metal** with an intermediate layer between them. This layer comprises a rubber compsn. comprising a butyl rubber, polyoctenylene and a **copolymer** of an olefin and an epoxy-contg. acrylic ester. The rubber compsn. further comprises a **copolymer** of an olefin and an acrylic ester. The intermediate layer comprises three layers: the outer two layers comprising a **copolymer** of an olefin and an epoxy-contg. acrylic ester, and the other layer inserted between them comprising a butyl rubber and polyoctenylene, and pref. a **copolymer** of an olefin and an acrylic ester.

USE/ADVANTAGE - The sheet has a vibration damping capability over a wide temp. range. It can be used to prepare composites. @(24pp Dwg.No.2/4)@

Title Terms /Index Terms/Additional Words: VIBRATION; DAMP; SHEET; COVER; WIDE; TEMPERATURE; RANGE; COMPRISE; LAYER; BUTYL; RUBBER; POLY;

OCTENYL; ENE; POLYOLEFIN; POLYEPOXIDE; CONTAIN; POLYACRYLIC;
ESTER; **COPOLYMER**; TWO ; **METAL**

Class Codes

International Patent Classification					
IPC	Class Level	Scope	Position	Status	Version Date
B32B-0015/06	A	I		R	20060101
B32B-0021/08	A	I	F	R	20060101
B32B-0025/18	A	I	L	R	20060101
F16F-0009/30	A	I		R	20060101
B32B-0015/06	C	I		R	20060101
B32B-0021/00	C	I	F	R	20060101
B32B-0025/00	C	I	L	R	20060101
F16F-0009/00	C	I		R	20060101

ECLA: B32B-015/06, F16F-009/30L

US Classification, Current Main: 428-457000; Secondary: 428-3550AC, 428-3550EN, 428-3550EP, 428-363000 , 428-415000, 428-416000, 428-462000, 524-445000, 524-449000, 524-501000, 524-521000

US Classification, Issued: 428457, 428245, 428246, 428355, 428369, 428415, 428416, 428462, 524521, 524448, 524449, 524501

File Segment: CPI; EngPI

DWPI Class: A88; P73; Q17; Q43

Manual Codes (CPI/A-N): A04-F06E; A04-G01E; A05-A04; A07-A02C; A12-H09

10/5/82 (Item 31 from file: 351)

DIALOG(R)File 351: Derwent WPI

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0005158024 *Drawing available*

WPI Acc no: 1990-147780/199019

XRAM Acc no: C1990-064706

XRPX Acc No: N1990-114510

Heat-sealable cap for thermoplastic polyester vessel - is laminate of metal, polyepoxy-polyphenol resin primer, and copolymer polyester resin

Patent Assignee: TOYO SEIKAN KAISHA LTD (TOXO)

Inventor: IMATANI T; KURASHIMA H; SUZUKI K; TAIRA K

Patent Family (6 patents, 3 countries)							
Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
WO 1990003886	A	19900419	WO 1989JP1047	A	19891012	199019	B
JP 2258577	A	19901019	JP 1988132333	A	19881012	199048	E
			JP 198963815	A	19890317		
GB 2233917	A	19910123				199104	E
GB 2233917	B	19920819	WO 1989JP1047	A	19891012	199234	E
			GB 199013029	A	19891012		
US 5204181	A	19930420	US 1990476497	A	19900612	199317	E
US 5721028	A	19980224	US 1990476497	A	19900612	199815	E
			US 1993687	A	19930105		

Priority Applications (no., kind, date): JP 1988132333 U 19881012; JP 198963815 A 19890317

Patent Details						
Patent Number	Kind	Lan	Pgs	Draw	Filing Notes	
WO 1990003886	A	EN				
National Designated States,Original	GB US					
GB 2233917	B	EN	0	1	PCT Application	WO 1989JP1047
					Based on OPI patent	WO 1990003886
US 5204181	A	EN	17	5		
US 5721028	A	EN	17	5	Division of application	US 1990476497
					Division of patent	US 5204181

Alerting Abstract WO A

Heat-sealable cap for heat-sealing thermoplastic polyester vessels comprises laminate of a heat-sealing layer (3 in Figure) whose major component is a **copolymer** polyester resin with a softening point of 120 deg.C or above and a glass transition temp. of 30-85 deg.C; an epoxy-phenol resin primer layer (2) and a metallic layer (1). (4 is a protective outer coating). The heat-sealing polyester resin is pref. a **copolymer** whose acid component contains 20-95% (molar) terephthalic acid, and whose diol component contains 20-95% (molar) of ethylene glycol; it pref. has an intrinsic viscosity 0.4-1.2. The primer is pref. an epoxy resin/phenol resin composite in the ratio 35:65-95:5 (wt.) and the phenol resin part is a mixt. of resin components having $IF=1.5-2.8$, where $IF= 2M_2+3M_3+4M_4$; M_2 , M_3 and M_4 are respectively the number of moles in 100 g total phenol component of bifunctional-and trifunction-monophenol, and diphenol. Esp. pref. is a phenol/epihydrin

condensate with epoxy equiv. 600-6000. The metallic layer is pref. aluminium foil, steel foil (opt. electrochrome treated), aluminium sheet, etc.. The heat-sealable part of the vessel is pref. a thermoplastic polyester with a melt temp. of at least 200 deg.C in the crystalline state and (thermally) crystallised; e.g. PET polybutylene terephthalate or polyethylene naphthalate.

USE/ADVANTAGE - Heat-seal formed is capable of resisting hot water treatment e.g. retort sterilisation and is pref. used in food containers.

Title Terms /Index Terms/Additional Words: HEAT; SEAL; CAP; THERMOPLASTIC; POLYESTER; VESSEL; LAMINATE; METAL; POLYEPOXIDE; POLYPHENOL; RESIN; PRIME; **COPOLYMER**

Class Codes

International Patent Classification					
IPC	Class Level	Scope	Position	Status	Version Date
B32B-0015/08	A	I		R	20060101
B65D-0017/40	A	I		R	20060101
B65D-0077/20	A	I	F	R	20060101
B65D-0077/20	A	I		R	20060101
B32B-0015/08	C	I		R	20060101
B65D-0017/28	C	I		R	20060101
B65D-0077/10	C	I	F	R	20060101
B65D-0077/10	C	I		R	20060101

ECLA: B32B-015/08, B65D-077/20D

US Classification, Current Main: 428-035800, 428-349000; Secondary: 220-200000, 428-344000, 428-349000 , 428-353000, 428-35500R, 428-416000

US Classification, Issued: 428349, 428344, 428353, 428355, 428416, 42835.8, 220200, 428344, 428349, 428416

Japan National Classification FI Terms			
FI Term	Facet	Rank	Type
B65D-077/20 E			
B65D-077/20 S			

Japan National Classification F Terms		
Theme	ViewPoint + Figure	Additional Code
3E067		
3E067	AB01	
3E067	BA02	A
3E067	BA07	A
3E067	BA10	A
3E067	BB11	A
3E067	BB12	A
3E067	BB14	A
3E067	BB25	A
3E067	BC07	A
3E067	CA04	
3E067	CA17	
3E067	CA24	
3E067	DA04	
3E067	EA06	
3E067	GC01	
3E067	GC02	
3E067	GD07	

File Segment: CPI; EngPI

DWPI Class: A28; A92; P73; Q33; Q34

Manual Codes (CPI/A-N): A05-A01E3; A05-C01B1; A05-E01D3; A08-M01B; A11-C01A1; A12-P01; A12-P03

10/5/104 (Item 53 from file: 351)

DIALOG(R)File 351: Derwent WPI

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0002281012

WPI Acc no: 1981-96068D/198152

Metal foil-resin laminate production - using resin obtd. from cyanic acid ester resin, polybutadiene resin and/or polyepoxy ester resin of (meth)polyacrylic acid

Patent Assignee: MITSUBISHI GAS CHEM IND CO LTD (MITN)

Patent Family (2 patents, 1 countries)							
Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
JP 56148547	A	19811118	JP 198052610	A	19800421	198152	B
JP 1985026705	B	19850625	JP 198052610	A	19800421	198529	E

Priority Applications (no., kind, date): JP 198052610 A 19800421

Patent Details					
Patent Number	Kind	Lan	Pgs	Draw	Filing Notes
JP 56148547	A	JA	7		

Alerting Abstract JP A

In the prodn. of **metal** foil-clad laminated sheet, resinous compsn. obtd. by mixing or preliminary reaction of (a) cyanic acid ester type resinous compsn., (b) butadiene type resin and/or (c) epoxy ester of (meth)acrylic acid or **prepolymer** of the **epoxy** ester, is applied to the **plastic** film or sheet, prepreg or **metal** foil and is semicured. The **plastic** film or sheet may be reinforced with base sheet which has softening pt. of at least 120 deg.C. The prepreg is pref. prepared by coating or impregnating base sheet with thermosetting or thermoplastic resin which has been modified to have crosslinking properties followed by (semi)-curing. The lamination is pref. carried out in continuous process using long film, sheet, prepreg and **metal** foil.

The sheet shows strong adhesion to **metal** foil and is excellent in resistance to heat and moisture, and good electrical properties.

Title Terms /Index Terms/Additional Words: **METAL**; FOIL; RESIN; LAMINATE; PRODUCE ; OBTAIN; CYANIC; ACID; ESTER; POLYBUTADIENE; POLYEPOXIDE; METHO; POLYACRYLIC; POLYMETHACRYLIC

Class Codes

International Patent Classification					
IPC	Class Level	Scope	Position	Status	Version Date
B29C-043/10; B29C-051/12; B32B-015/08; C08J-005/12; H05K-001/03			Secondary		"Version 7"

File Segment: CPI; EngPI

DWPI Class: A18; A21; A32; P73

Manual Codes (CPI/A-N): A04-B02; A05-J02; A07-A03; A07-A04; A10-E07B; A11-B09; A12-S07A; A12-S08A

10/5/105 (Item 54 from file: 351)
DIALOG(R)File 351: Derwent WPI
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0002183127

WPI Acc no: 1981-71689D/198139

**Energy absorbing elastomer for e.g. high speed vehicles - mfd. using prod. of
polyepoxy resin and polymer obtd. from polycarboxylic acid and tungsten and/or
molybdenum carbonyl-pyrrolidine complex**

Patent Assignee: HITCO CORP (HITC)

Inventor: LEWIS K W; SHAFFER R C

Patent Family (1 patents, 1 countries)							
Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
US 4288568	A	19810908	US 1980173453	A	19800730	198139	B
			US 1980173453	A	19800730		

Priority Applications (no., kind, date): US 1980173453 A 19821119

Patent Details					
Patent Number	Kind	Lan	Pgs	Draw	Filing Notes
US 4288568	A	EN	4		

Alerting Abstract US A

A novel elastomer contg. chemically bonded **metal** atoms is obtd. by reacting a diene elastomer with the reaction prod. of an **epoxy** resin and a **metal**-contg. **polymer** (I). (I) is prepd. by reacting a polycarboxylic acid and a **metal** complex which is the reaction prod. of W carbonyl and/or Mo carbonyl with pyrrolidine.

The rubber can absorb large amts. of energy while maintaining comparable physical characteristics of C loaded, not **metal** bearing rubber. It is resistant to high speed pebble impact and dust erosion and has a low level of thermal conductivity. It is useful as energy shielding, as coatings and in adhesives, e.g. for high speed vehicles travelling in hostile environments.

Title Terms /Index Terms/Additional Words: ENERGY; ABSORB; ELASTOMER;
HIGH; SPEED; VEHICLE; MANUFACTURE; PRODUCT; POLYEPOXIDE; RESIN;
POLYMER; OBTAIN; POLY; CARBOXYLIC; ACID; TUNGSTEN;
MOLYBDENUM; CARBONYL; PYRROLIDINE; COMPLEX

Class Codes

International Patent Classification					
IPC	Class Level	Scope	Position	Status	Version Date
C08G-0063/68	A	I		R	20060101
C08G-0079/00	A	I		R	20060101
C08L-0021/00	A	I		R	20060101
C08L-0063/00	A	I		R	20060101
C08L-0085/00	A	I		R	20060101
C08L-0009/02	A	I		R	20060101
C08G-0063/00	C	I		R	20060101
C08G-0079/00	C	I		R	20060101
C08L-0021/00	C	I		R	20060101
C08L-0063/00	C	I		R	20060101
C08L-0085/00	C	I		R	20060101
C08L-0009/00	C	I		R	20060101

ICO: M08L-013:00, M08L-063:00

US Classification, Current Main: 525-111000; Secondary: 525-113000

US Classification, Issued: 525111, 525113

File Segment: CPI

DWPI Class: A12; A21

Manual Codes (CPI/A-N): A04-B01; A09-A01A; A09-A05; A10-E01

Dialog eLink:

USPTO Full Text Retrieval Options

10/5/125 (Item 2 from file: 323)

DIALOG(R)File 323: RAPRA Polymer Library

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00756559

Title: EPOXY TARGETS MEDICAL

Source: Modern Plastics International ; 29, No.12, Dec.1999, p.77

ISSN: 0026-8283

CODEN: MOPLAY **Journal Announcement:** 200003 **RAPRA Update:** 200004

Document Type: Journal Article

Language: English

Subfile: (R) RAPRA

Abstract: Single-component epoxy adhesive, Permabond 4E98, cures in 1h at 80C or in 5min at 120C. It is intended for bonding heat-sensitive plastics substrates. It also provides structural strength in bonding metal parts such as needles, scalpels and surgical instruments to plastics. Grade 4C10 is a single-component adhesive which polymerises rapidly when pressed into a film between parts. At room temperature it is colourless. It is intended to bond polyester, ABS, polycarbonate and PVC. This abstract includes all the information contained in the original article.

Subject Heading (RAPRA): ADHESIVES, epoxy resins, medical applications; EPOXY RESINS, adhesives, medical applications; MEDICAL APPLICATIONS, adhesives, epoxy resins

Subject Heading (Adhesives): EPOXY RESINS, adhesives of, medical applications; MEDICAL APPLICATIONS, adhesives for, epoxy resins

Trade Names: PERMABOND 4E98

Company Name: PERMABOND LTD.

Geographic Location: EUROPEAN COMMUNITY; EUROPEAN UNION; UK; WESTERN EUROPE

Descriptors: ABS; ADHESION; ADHESIVE; CARBONATE **POLYMER**; COMPANIES; COMPANY; CURE TEMPERATURE; CURE TIME; DATA; EPOXIDE RESIN; **EPOXY** RESIN; HEAT-SENSITIVE; MECHANICAL PROPERTIES; **METAL** ADHESION; ONE-COMPONENT ; **PLASTIC**; POLYCARBONATE; POLYEPOXIDE; POLYVINYL CHLORIDE; PROPERTIES; PVC; SATURATED POLYESTER; SHORT ITEM; SINGLE-COMPONENT; STRENGTH; STRUCTURAL PROPERTIES; THERMOPLASTIC; THERMOSET; TRANSPARENT; VULCANISATION TIME; VULCANIZATION TIME

RAPRA Classification Code: 43E; 6A1; 6S

Category Codes: QB; KV; QQ

Adhesives Category Codes: AND; ALP

DIALOG(R)File 348: EUROPEAN PATENTS

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10/5/138 (Item 7 from file: 348)

00244542

Aqueous epoxy resin can coating compositions.

Wassrige Zusammensetzungen auf der Basis von Epoxydharzen für die Beschichtung von Dosen.

Compositions aqueuses à base de résines époxydes comme revêtement de boîtes.

Patent Assignee:

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	Country	Number	Kind	Date	
Patent	EP	232021	A2	19870812	(Basic)
Patent	EP	232021	A3	19880504	
Patent	EP	232021	B1	19920311	
Application	EP	87300288		19870114	
Priorities	US	819956		19860121	

Designated States:

BE; CH; DE; FR; GB; LI; NL; SE

International Patent Class (V7): C09D-163/02; C09D-201/08; C08L-063/02; C08L-033/02; C08L-061/06

Abstract EP 232021 A2

Heat curable coating compositions particularly suitable as coatings for **metal** can ends are made from aqueous dispersions of epoxy resins, acrylic resins which are copolymers of polymerizable acids and other monomers, and alkylated phenol novolac resins.

Abstract Word Count: 38

Legal Status Type	Pub. Date	Kind	Text
Application:	19870812	A2	Published application (A1with;A2without)
Search Report:	19880504	A3	Separate publication of the European or International

Legal Status Type	Pub. Date	Kind	Text
			search report
Examination:	19881214	A2	Date of filing of request for examination: 881019
Examination:	19900110	A2	Date of despatch of first examination report: 891127
Grant:	19920311	B1	Granted patent
Oppn None:	19930303	B1	No opposition filed

Language Publication: English

Procedural: English

Application: English

Fulltext Availability	Available Text	Language	Update	Word Count
CLAIMS B		(English)	EPBBF1	349
CLAIMS B		(German)	EPBBF1	335
CLAIMS B		(French)	EPBBF1	402
SPEC B		(English)	EPBBF1	3516
Total Word Count (Document A) 0				
Total Word Count (Document B) 4602				
Total Word Count (All Documents) 4602				